Author’s response to reviews

Title: Perceived economic situation but not educational level is associated with disability prevalence in the Spanish elderly: observational study

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Author’s response to reviews: see over
Dear Editor,

Thank you very much for the reviewers’ comments. We answer them point-by-point:

**Answers to Qiushi Feng’s review:**

1) The use of subjective economic status instead of actual income is valuable, and the authors indeed pointed out some advantages of this measure; however such self-reporting of economic situation also brings in factors which are not directly related to economic situations of the elderly. For example, reference group chosen to make the comparative judgment of the economic situation is not stable and could vary among individuals. Moreover, as the author pointed out, the psychological factors also matter in the self-reporting. If so, whether such a subjective measurement could indicate the true economic situation in a more accurate way was not for sure, and the authors needs to be more conservative in their support for the subjective measures. Additionally, another related measurement, “difficulty in making ends meet”, was not justified in the introduction and appeared quite confusing for readers.

*Maybe we were too adamant in the abstract (which has been moderated accordingly), but we did not intend to mean that the subjective perception of the economic situation was a more accurate way to measure the ‘true’ economic situation, if it could be defined. We only believe that it is a complementary way of measuring the economic situation with pros and cons. We have included in the discussion a comment on your very appropriate remark on the lack of a common reference group (second paragraph of page 11). We have added a variable related to psychological attitude towards life, will to live, to the multivariate models to explore its confounding and intermediary effects, which appear very modest.*

*The introduction has been changed to show that difficulty making ends meet is an alternative way to measure the subjective economic position.*

2) From the manuscript, it seems that the authors only focused on the “disability starting in old age” (p5), and because of this, the authors dropped those whose disability started before 50s. However there is no clue in the measurement of disability about such a time requirement.

*You are totally right. We have included the variable on age of appearance of the disability in the methods section (outcome variable section).*
3) To rule out the reverse causality, the authors only used cases with “fixed” job income before disability; however it seems not an effective strategy. The current subjective economic status could still be affected by incidence of disability even though the job income is fixed before disability.

We believe that our procedure rules out the main cause of reverse causality. Nevertheless, as you mention there is also a possibility that disability alters attitude towards life and this in turn worsens the subjective economic perception. The modest changes observed in the association between the subjective economic situation and disability, which remains significant and strong after adjusting for the variable of will to live do not support strongly this interpretation.

4) The modeling strategy are not fully justified. For example, what is the purpose to run binary regressions before the multivariate analysis? In addition, some results such as the figures appear redundant without clear justification, because the major patterns have been shown in the regression models. Are there any specific reasons to represent the same results in figures?

Comparing bivariate and multivariate coefficients is the only way to assess the effect of adjustment of principal variables by covariates such as age and sex. This strategy has shown, for example, that the effect of studies disappears after accounting for these variables, but that of the economic situation persists. Results shown in figure 2 add important information to tables because they present probability of being disabled by specific attributes, while tables give changes in reference odds ratios by specific attributes. Probabilities are easier to interpret than odds ratios and figure 2 is intended to help on that.

English has been reviewed by a professional translator.

Answers to Danan Gu’s review:

1. keywords: “80 and over” may not be appropriate as this study only includes 710 elders aged 60+. Related to this, please do not to be too certain about the national representativeness of such a sample with only 710 respondents.

There are 132 individuals 80 years and older in our sample. This information has been incorporated to the results section (second paragraph). Therefore we consider the use of the keyword “aged, 80 and over” justified.
Representativeness is not related to the sample size if it is not of very limited dimensions. If it is not too small, it is related to the sampling design and the absence of response bias. The ELES pilot study has been designed to be representative, but we acknowledged that response bias has been an issue in the discussion (limitations paragraph). Following your suggestion, we have rephrased the following sentence in the study’s strengths paragraph: “We have worked with a sample designed to be representative of the elderly Spanish population”.

2. Page 4, Last sentence before Methods Section: “The hypothesis is that there will be effect of the economic level over and above that of education” is unclear to me. Considering revising.

We have rewritten it: “Our hypothesis is that there will be a statistically significant association with the subjective economic level after adjusting for education.”

3. The authors noted that "The sample frame is the directory of dwellings' telephones." I just wonder (1) where is the telephone list from (a local public phonebook, or elsewhere)? (2) What is the proportion of local residents who do not have a dwelling phone (nowadays people may use cell phone and some household may have no phone)? If the proportion is not very high, it could produce biases for sampling as those households/persons who have a phone may tend to be in a better economic condition.

1) The telephone list is a commercial directory of dwellings’ telephones that is commonly used by Spanish market research companies.

2) The coverage of land telephone lines in Spain between 2004 and 2011 was higher than 92% of dwellings where any resident is 50 years or older [Spanish National Statistics Institute: personal communication based on the data of the survey on equipment and usage of ICTs in households (Encuesta sobre equipamiento y uso de TIC en los hogares)]. Mobiles are not widespread among the Spanish elderly, in part because the cost of landlines for the retired people is subsidized. This minimizes the socioeconomic bias of owning a landline. Both informations have been added to the methods section (beginning of page 5).

4. Page 5, Last paragraph before Statistical analysis: what does “never worked” mean? how about self-employment?

In the ELES questionnaire, self-employment was considered clearly as a form of work. We have improved the sentence: “In order to minimize the main source of reverse causality, where the development of disability can produce a reduction in job income and therefore in the self-
perceived economic level, only individuals whose job income levels (including those generated by self-employment) were fixed before becoming disabled were selected:”

5. Page 6, middle paragraph: b) sentences should be rephrased and should not use "+" between different categories.

The paragraph has been rewritten.

6. Page 9: the authors used “the probability” for ages at 85. To me, it is too scary to go beyond to age 80 as there should not be many respondents among 710 elders aged 60+. As the estimated probability is model-based, it should not be stressed after age 80. I also suggest dropping the line for age 85 in Figure 2. In Figure 2, what is the measuring unit for Y axis? In addition, the authors need to tell readers how this probability is calculated.

32 people were 85 years or over. This would be considered a big number in statistical terms and we think it allows calculating estimations. A title for the Y axis has been incorporated. The coefficients of a logistic multivariate model allow calculating the predicted probability for a set of attributes with standard software (added to second paragraph of page 9).

7. Page 12: The 1st paragraph should be enhanced to interpret the possible mechanism why the education loses its significance after controlling age and sex. Also, the last sentence needs more elucidation and/or citations to support it.

We have included a phrase showing the association of educational level and age and sex in our sample.

8. The authors reviewed some mechanism (mainly behavioral factors) linking between SES and health/disability. This is good and a correct way to do so. But I just wonder why the authors did not include some behavioral variables (if available) into modeling.

We agree with the reviewer that it would have been very interesting to include behavioral variables, which were available, in the model. Nevertheless, we had only 77 disability cases in our sample and it is recommended not to use more than cases/10 variables (including dummy variables) in logistic models to avoid overfitting. With the sociodemographic, education, income and psychological variables (see the answer to the other reviewer) we already reached that level. Following your suggestion, we added these commentaries to the discussion (limitations paragraph).
9. Some references are very old, dating back to the 1980s. It is better to cite the most recent ones.

*We believe Liberato’s reference is bedrock in the study of economic inequalities. The other eighties reference has been substituted by a more recent one.*

10. English needs some editing.

*As said above, English has been reviewed by a professional translator.*